State of Iowa - Return on Investment Program / IT Project Evaluation

SECTION 1: PROPOSAL

Tracking Number (For Project Office Use)

Project Name: 21st Century Learning Infrastructure Date: FY02

Agency Point of Contact for Project: Marilyn Drury

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Executive Sponsor (Agency Director or Designee) Signature: Robert Koob – President – UNI; Richard Varn – ITD; Tommy Thompson – ICN; Dave Bolender – IPTV; Ted Stilwill – DOE, Sharman Smith – State Librarian

Is this project necessary for compliance with a Federal standard, initiative, or statute? (If "Yes," cite specific requirement, attach copy of requirement, and explain in Proposal Summary)	❑ Yes	■ No
Is this project required by State statute? (If "Yes," explain in Proposal Summary)	❑ Yes	■ No
Does this project meet a health, safety or security requirement? (If "Yes," explain in Proposal Summary)	❑ Yes	■ No
Is this project necessary for compliance with an enterprise technology standard? (If "Yes," explain in Proposal Summary)	❑ Yes	■ No
Does this project contribute to meeting a strategic goal of government? (If "Yes," explain in Proposal Summary)	■ Yes	❑ No
Is this a "research and development" project? (If "Yes," explain in Proposal Summary)	■ Yes	❑ No

PROPOSAL SUMMARY:

In written detail, explain why the project is being undertaken and the results that are expected. This includes, but is not limited to, the following:

1. A pre-project (before implementation) and a post-project (after implementation) description of the system or process that will be impacted.

2. A summary of the extent to which the project provides tangible and intangible benefits to either Iowa citizens or to State government. Included would be such items as qualifying for additional matching funds, improving the quality of life, reducing the government hassle factor, providing enhanced services, improving work processes, complying with enterprise technology standards, meeting a strategic goal, avoiding the loss of matching funds, avoiding program penalties/sanctions or interest charges, avoiding risks to health/security/safety, complying with federal or state laws, etc.

3. A summary that identifies the project stakeholders and how they are impacted by the project.

Proposal Summary

A 21st Century Learning Infrastructure utilizes a wide range of information technologies to provide learning opportunities within and beyond the bounds of the traditional classroom and supports life-long learning. It will be a combination of a digital library and a virtual open campus for all learners and institutions.

This 21st Century Learning Infrastructure has seven main components:

*1. **Integration:** Integration in this context means an entity that will bring together all of the vendors, providers, and partners, enable them to work together, and keep an eye on the big picture. The best analogy for an integrator is a general contractor who manages the subcontractors who provide the different pieces of the project. The integrator would also assure interoperability, upgradeability, and quality.*

*2. Central and distributed **Storage** and cataloging systems for digital educational materials - (digital pictures, audio and video; interactive web sites; electronic presentations; e-books; software; and evaluation mechanisms). Educational materials can be mixed, matched, exchanged and sold.*

*3. **Networking and Connectivity:** A network architecture design that allows for equitable delivery of desired quality of service to all citizens in the state of Iowa. This initiative will utilize the Iowa Communications Network and private telecommunications providers, assess current network capacity and assist with upgrades.*

*4. **Distribution:** Movement of educational objects via networks (HTTP, Real Time Streaming Protocol (RTSP) WAN, LAN, ATM, Dial-Up, ISDN, Internet/Intranet) and via storage media (CD and DVD-ROM, etc.). There will be video, voice, data, document, or virtual reality interaction using multimedia conferencing standards.*

*5. **Learning Management:** Tools for tracking, testing, registering, managing, authoring, and cataloging online educational offerings incorporating collaborative technologies for communication between learners, instructors, and experts.*

*6. **Acquisition:** Purchase, customize**,** transcribe, broker, and license digital and analog educational objects for use, storage, searchability, and distribution.*

*7. **Infrastructure Management:** Tools for data exchange, reporting, authentication, security, help desk, ADA compliance, and systems support.*

The University of Northern Iowa (UNI), the State of Iowa Information Technology Department (ITD), the Iowa Communications Network (ICN), the Iowa Department of Education (DOE), Iowa Public Television, and the State Library will collaboratively focus on exploring, testing, evaluating, and recommending technology components, that through effective use lead to enhanced learning in various educational settings.

The 21st Century Learning Infrastructure will allow teachers and students (and ultimately all Iowans) to electronically receive digital educational material and professional development on demand. This will be done through the creation of a prototypical multimedia-based digital library. Implementation of this project would dramatically change the way schools receive media.

The first step in making the technology effective in schools is for teachers to master the digital tools. The delivery of professional development as an integral part of this project will allow teachers to weave the use of technology into their daily teaching strategies and curricula.

SECTION 2: PROJECT PLAN

Individual project plans will vary depending upon the size and complexity of the project. A project plan includes the following information:

1. Agency Information

Project Executive Sponsor Responsibilities: Identify, in Section I, the executive who is the sponsor of the project. The sponsor must have the authority to ensure that adequate resources are available for the entire project, that there is commitment and support for the project, and that the organization will achieve successful project implementation.

Robert Koob – President – UNI; Richard Varn – ITD; Tommy Thompson – ICN; Dave Bolender – IPTV; Ted Stilwill – DOE, Sharman Smith – State Library

Organization Skills: Identify the skills that are necessary for successful project implementation. Identify which of these skills are available within the agency and the source(s) and acquisition plan for the skills that are lacking.

The partners in the Pilot will have the skills necessary for the project or will subcontract with others to obtain personnel with appropriate skills. Such skills include: multimedia system administration, multimedia courseware development, project management, telecommunications, networking connectivity, trainers, instructional designers, multimedia specialists, copyright staff, and content creators/gatherers

2. Project Information

Mission, Goals, Objectives: The project plan should clearly demonstrate that the project has developed from an idea to a detailed plan of action. The project plan must link the project to an agency's mission, goals, and objectives and define project objectives and how they will be reached. The project plan should include the following:

Mission: *The State of Iowa Information Technology Department, the Department of Education, the Iowa Communications Network, and the University of Northern Iowa will work together on a 21st Century Learning Infrastructure initiative collaborative pilot project during the 2001 fiscal year, using an appropriation from the legislature, focused on enhancing the learning for Iowa's students. The project will have the following primary purposes: 1) the acquisition and creation of digital educational materials; 2) to research, test, and evaluate indexing systems for easy acquisition of content over the internet; 3) delivery and use of the content in the classroom; 4)*

provide instructional design and developmental support to the classroom teacher; 5) to evaluate the success of the pilot and make recommendations.

Project Elements:

- *Continue to test a flexible infrastructure environment that facilitates the delivery and use of the content as needed*
- *Identify and acquire additional digital educational material that serve common educational needs within and beyond the boundaries of the classroom.*
- *Continue to evaluate different architectures and approaches to sharing and delivering digital content over the internet*
- *Test the ease of searching and delivery of the content to the classroom from remote sites.*
- *Test and evaluate the delivery and reception of digital educational material to be used within and beyond the classroom.*
- *Provide instructional design and development support to teachers, allowing them to take shared digital assets and incorporate their use into their curriculum.*
- *Identify ways the project can continue to impact the CSIP (Continuous School Improvement Plan) for the identified schools.*
- *Provide effective communication to those directly involved and those who are stakeholders.*
- *Provide assessment and evaluation of progress and results.*

Criteria for Participation:

- *Schools should be willing to allow for teacher participation in professional development*
- *School administrators must support the project.*
- *Participants must be able to meet reasonable goals that will be set by the 21st Century Project staff, realizing the intensity will be in the January to April of 2002 timeframe.*
- *Teachers should be experienced with using technology in the classroom.*
- *AEAs must support the project*
- *Classrooms need access to the Internet*
- *Participating schools and AEAs must have a T1 line for their internet connection provided by the ICN*

(A <u>limited</u> number of AEAs and schools will be selected to participate.)

Parallel Project Elements (these are a continuation from year one)

- *Perform an assessment (scan) of current education technology, distance learning, and digital library environments in the state of Iowa*
- *Design a functional, state-wide electronic learning and library architecture*
- *Development of Request for Proposal(s) (RFP)*

A. **<u>Expectations</u>**: A description of the purpose or reason that the effort is being undertaken and the results that are anticipated.

To continue building and testing a prototype that will provide online learning opportunities which are currently being offered via networks by many educational institutions, businesses and libraries in Iowa. The 21st Century Learning Infrastructure initiative is an

effort to enhance, coordinate, and increase current and future distance learning/digital library offerings thereby enabling all citizens of the state of Iowa the increased opportunity to partake in quality life-long learning.

B. **Measures**: A description of the set of beliefs, tradeoffs and philosophies that govern the results of the project and their attainment. How is the project to be judged or valued? What criteria will be used to determine if the project is successful? What happens if the project fails?

The purposes of this project are to test and evaluate the delivery of additional digital content to more classrooms from remote sites. With the involvement of additional AEAs, local teachers, and UNI faculty, the effective use of the selected content in the classroom and the enhanced learning opportunities this use brings will also be judged. This will be done through verbal and/or written evaluations from the students, teachers, and other participants involved.

C. **Environment:** Who will provide input (e.g., businesses, other agencies, citizens) into the development of the solution? Are others creating similar or related projects? Are there cooperation opportunities?

The following groups will work together to ensure success of the project: State of Iowa's Information Technology Department, Department of Education, Iowa Communication Network, Iowa Public Television, the University of Northern Iowa, participating AEAs and schools, and the 21st Century Learning Infrastructure Stakeholders Group.

D. **Project Management and Risk Mitigation**: A description of how you plan to manage the project budget, project scope, vendors, contracts and business process change (if applicable). Describe how you plan to mitigate project risk.

The scope of this project shall be kept to "Middle School Math" and participants limited to 3 AEAs and 2 schools within each AEA. Participating AEAs and schools shall sign Participant Agreements. Regular reporting will be done on a quarterly basis to the following groups as needed:

1. *Oversight Group – Robert Koob (President, UNI), Richard Varn (CIO, ITD), Ted Stilwill (Director, DOE), and Garry Bozylinsky (Associate Vice-President for Information Technology Services, UNI)*
2. *Management Group (Marilyn Drury, Doreen Hayek, Rick Seeley – UNI; Lisa Andersen, Matt Behrens, Darrell Fremont – ITD; John O'Connell - DOE)*
   Three subgroups composed of Management Group members and participants from selected AEAs, ICN, and local schools
   - *Technical (Architecture/Delivery) Group*
   - *Subject/People Group*
   - *Communication/Project Management Group*
3. *Stakeholders Group - group of listeners and those impacted who advise or direct as necessary or as requested*
4. *Contractors, as needed, to provide additional services and skills*

Budgeting will flow through UNI's accounting process.

E. **Security / Data Integrity / Data Accuracy / Information Privacy**: A description of the security requirements of the project? How will these requirements be integrated into the project and tested. What measures will be taken to insure data integrity, data accuracy and information privacy?

The level of security will be based on requirements of the services requested and provided.

Data will be backed up based on the requirements of the services requested and provided. The backups will be stored off site.

Information privacy will be based on the requirement of the services requested and provided. If needed, outside consultants will be hired to analyze current procedures.

3. Current Technology Environment (Describe the following):

A. **Software (Client Side / Server Side / Midrange / Mainframe)**

- *Application software*
- *Operating system software*
- *Interfaces to other systems: Identify important or major interfaces to internal and external systems*

Media distribution software
Multimedia production software
Graphics design software
Web development software
Server and workstation OS
Online learning tools software
Database server software
Media reports software
Web reporting software
Media asset management and database software
Online learning management tools
DVD-ROM development and distribution software
Web server software
Multimedia development software

B. **Hardware (Client Side / Server Side / Mid-range / Mainframe):**

- *Platform, operating system, storage and physical environmental requirements.*
- *Connectivity and Bandwidth: If applicable, describe logical and physical connectivity.*
- *Interfaces to other systems: Identify important or major interfaces to internal and external systems.*

Media distribution servers
Web server
Online learning server
Media storage arrays
Media back-up unit
Multimedia production workstations
Web reporting hardware
Media asset management and database hardware
Online learning management hardware
Media distribution hardware
DVD-ROM development and distribution hardware
Server and client hardware
Multimedia development hardware
Web development hardware
New and emerging technologies

The current hardware facilitates the creation and distribution of digital content. The hardware currently obtained will need to continue to grow in relation to the roll-out of the 21st Century Infrastructure.

4. Proposed Environment (Describe the following):

A. Software (Client Side / Server side / Mid-range / Mainframe)

- *Application software.*
- *Operating system software.*
- *Interfaces to other systems: Identify important or major interfaces to internal and external systems.*
- *General parameters if specific parameters are unknown or to be determined.*

We expect the usage of the 21st Century Infrastructure to continue to grow. We will continue to integrate additional client and server side software that will aid in the development and distribution of the educational objects.

B. Hardware (Client Side / Server Side / Mid-range / Mainframe)

- *Platform, operating system, storage and physical environmental requirements.*
- *Connectivity and Bandwidth: If applicable, describe logical and physical connectivity.*
- *Interfaces to other systems: Identify important or major interfaces to internal and external systems.*
- *General parameters if specific parameters are unknown or to be determined.*

We will need to acquire additional servers, storage arrays, mobile video conferencing units, and network equipment to support growth and additional functionality. Testing and beta

equipment will need to be acquired to try new technologies for implementation in to the system.

Data Elements: If the project creates a new database the project plan should include the specific software involved and a general description of the data elements.

Any data elements created or involved in this project will be independent of the existing State system and would be installed and delivered via newly acquired hardware and software. New data elements would include indexing systems, digital educational materials (i.e. digital pictures, audio and video; interactive web sites; electronic presentations; e-books; software; and evaluation mechanisms), and infrastructure information gathered by an outside contractor. Educational material can be mixed, matched, exchanged and sold.

Project Schedule: A schedule that includes: time lines, resources, tasks, checkpoints, deliverables and responsible parties.

June	*Initial introductory meeting*
July	*Project team identified; planning underway*
	Participants identified and contacted
August	*Project defined and milestones set*
	Additional staffing needs identified
September	*Staff hired or identified and committed*
October	*Content acquired (digital objects and modules)*
	Hardware/software components identified, acquired, installed, and tested
	Evaluation criteria and process defined
November	*Hardware/infrastructure issues resolved (tools are ready)*
December	*Training and instructional design assistance completed*
January	*Begin implementation in the actual classrooms*
May 1 – June 1	*Evaluation of project and summary document*

We will expand the 21st Century Learning Infrastructure to as many schools/communities as possible with the funding available. We will also expand Executive Sponsorship, number of AEAs and schools involved, and subject and content areas. We anticipate beginning the establishment of statewide contracts with qualified vendors for hardware, software, and digital asset purchasing.

SECTION 3: Return On Investment (ROI) Financial Analysis

Project Budget: FY02

Provide the estimated project cost by expense category.

Personnel	$ 0
Software	$ 450,000
Hardware	$ 1,155,000 (includes ICN Network Intranet Project)
Training	$ 65,000
Facilities	$ 0
Professional Services	$ 310,000
Supplies	$ 20,000
Other (Specify)……	$ 0
Total	$ 2,000,000

Project Funding: FY02

Provide the estimated project cost by funding source.

State Funds	$ 2,000,000	100	% of total cost
Federal Funds	$		% of total cost
Local Gov. Funds	$		% of total cost
Private Funds	$		% of total cost
Other Funds (Specify)	$		% of total cost
Total Cost:	$		% of total cost

Provide the estimated project cost by fiscal year.

How much of the cost would be incurred by your agency from normal operating budgets (staff, equipment, etc.)? …… $_____ _____%

How much of the cost would be paid by requested State IT project funds? $ 2,000,000 100%

Identify, list, and quantify all annual maintenance expenses (State Share) related to the project.

Identify, list, and quantify any other future expenses (State Share) related to the project.

ROI Financial Worksheet Directions (Attach Written Detail as Requested):

Annual Pre-Project Cost -- Quantify, in written detail, all actual State government direct and indirect costs (personnel, support, equipment, etc.) associated with the activity, system or process prior to

project implementation. This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

Pre-project cost would include expenditures for: personnel, support, equipment, software, telecommunications, media material acquisition, textbooks, library books, etc.

Annual Post-Project Cost -- Quantify, in written detail, all estimated State government direct and indirect costs associated with activity, system or process after project implementation. This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

We would expect long-term costs to be reduced due to: 1) joint purchasing/licensing statewide; 2) electronic distribution of materials; 3) sharing of resources and personnel; 4) more efficient use of the statewide infrastructure and architecture; 5) time savings in locating applicable content; 6) efforts that cross over and impact the Continuous School Improvement Plan

State Government Benefit -- Subtract the total "Annual Post-Project Cost" from the total "Annual Pre-Project Cost." This section should be completed only if State government costs are expected to be reduced as a result of project implementation.

We would expect long-term costs to be reduced due to: 1) the coordinated acquisition and creation of content 2) the provision of a cost-effective educational media and materials delivery system (decreased AEA delivery costs); 3) training via the Internet rather than traveling to classes; 4) expanded ICN services will allow for delivery of digital library materials/educational objects on demand.

Citizen Benefit -- Quantify, in written detail, the estimated annual value of the project to Iowa citizens. This includes the "hard cost" value of avoiding expenses (hidden taxes) related to conducting business with State government. These expenses may be of a personal or business nature. They could be related to transportation, the time expended on or waiting for the manual processing of governmental paperwork such as licenses or applications, taking time off work, mailing, or other similar expenses.

The value to Iowa citizens will be: 1) the eventual accessibility to electronic educational material 24 hours a day; 2) life-long learning opportunities; 3) personal and business electronic processing of data and documents; 4) reduction in wasted time and travel; 5) environmental benefits (i.e. increased air quality due to decrease of fuel consumption); 6) availability of resources leading to increased skills and potentially higher wages

Opportunity Value/Risk or Loss Avoidance Benefit -- Quantify, in written detail, the estimated annual benefit to Iowa citizens or to State government. This could include such items as qualifying for additional matching funds, avoiding the loss of matching funds, avoiding program penalties/sanctions or interest charges, avoiding risks to health/security/safety, avoiding the consequences of not complying with State or federal laws, providing enhanced services, avoiding the consequences of not complying with enterprise technology standards, etc.

Opportunity Value: Qualifying for additional funds via grants.

Total Annual Project Benefit -- Add the values of all annual benefit categories.

Total Annual Project Cost -- Quantify, in written detail, the estimated annual new cost necessary to implement and maintain the project including consulting fees, equipment retirement, ongoing expenses (i.e. labor, etc.), other technology (hardware, software and development), and any other specifically identifiable project related expense. In general, to calculate the annual hardware cost, divide the hardware and associated costs by three (3), the useful life. In general, to calculate the annual software cost, divide the software and associated costs by four (4), the useful life. This may require assigning consulting fees to hardware cost or to software cost. A different useful life may be used if it can be documented.

Benefit / Cost Ratio – Divide the "Total Annual Project Benefit" by the "Total Annual Project Cost." If the resulting figure is greater than one (1.00), then the annual project benefits exceed the annual project cost. If the resulting figure is less than one (1.00), then the annual project benefits are less than the annual project cost.

ROI -- Subtract the "Total Annual Project Cost" from the "Total Annual Project Benefit" and divide by the amount of the requested State IT project funds.

Benefits Not Cost Related or Quantifiable -- List the project benefits and articulate, in written detail, why they (IT innovation, unique system application, utilization of new technology, hidden taxes, improving the quality of life, reducing the government hassle factor, meeting a strategic goal, etc.) are not cost related or quantifiable. Rate the importance of these benefits on a "1 – 10" basis, with "10" being of highest importance. Check the "Benefits Not Cost Related or Quantifiable" box in the applicable row.

The 21st Century Learning Infrastructure could:

- *provide Iowa learners of all ages with access to a modern technology system for life-long learning - 10*
- *provide job training resources - 9*
- *make skills training and life-long learning more available at all levels - 10*
- *expand Internet-based resources for students, employers, and workers- 10*
- *expand pre-employment services to Iowans in transition (retain and retrain)- 8*
- *provide technical skills analysis for individuals relating to targeted jobs (skills gap)- 9*
- *make the greatest possible effective use of both distance learning and place-based education technologies for ALL on-site and off-site learners - 10*

ROI Financial Worksheet

Please see "Additional Benefits Information" on the following page.

Annual Pre-Project Cost - How You Perform The Function(s) Now		
FTE Cost (salary plus benefits):		
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):		
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):		
A. Total Annual Pre-Project Cost:		**N/A - New Program**
Annual Post-Project Cost – How You Propose to Perform the Function(s)		
FTE Cost:		
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):		
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):		
B. Total Annual Post-Project Cost:		
State Government Benefit (= A-B):		**N/A - New Program**
Annual Benefit Summary		
State Government Benefit:		
Citizen Benefit (including quantifiable "hidden taxes"):		
Opportunity Value and Risk/Loss Avoidance Benefit:		
C. Total Annual Project Benefit:	**$22,941,500 divided by 5 years**	**$4,588,300**
D. Total Annual Project Cost:		**$2,000,000**
Benefit / Cost Ratio (C / D):	**2.29**	
ROI (C – D / Requested State IT Project Funds):	**129%**	

☐ **Benefits Not Cost Related or Quantifiable (including non-quantifiable "hidden taxes")**

Additional Benefits Information

Reduction in Training Time

Research shows that the use of multimedia technologies, such as CBT or Web-based approaches, saves time – anywhere from 25-50+%, with most reports showing a 35-45% decrease. This savings is achieved with equivalent or better learning gains in terms of retention (remembering what was learned) and transfer (using what was learned).

Example: 10,000 state government employees x $20/burdened hour x 40 hours = $8,000,000
Note: Average salary of $33,000 (for state employees) with 25% burden for insurance, FICA, etc.

A 40% reduction in time saves $3,200,000 per 10,000 trained employees.

Reduction in Training Travel Expenses

Research shows that the multimedia approach can cut training travel expenses in half.

Example: Average travel expense per employee for a week ($500 airfare and 5 days of $100 per diem).
5,000 employees traveling x $1,000 = $5,000,000

A 50% reduction in travel expenses saves $2,500,000.

Value of Education to Earnings

Example: $26,805 (Average Iowa Salary) x 1% increase in salary x 60,000 (approximately 2% of Iowans) = $16,083,000

Decrease in AEA Delivery Costs

Approximately $200,000 over the next 5 years

Coordinated Acquisition of Content

Coordinating acquisition of digital content can cut costs by 1/3. According to our proposed budget, $450,000 will be spent on software. That figure reflects over $200,000 in savings per year. (5 year savings = $1,000,000)

Estimated Annual Savings (upon completion of project)

Reduction in Training Time	$3,200,000
Reduction in Travel Expenses	$2,500,000
Value of Education to Earnings	$16,041,500
Decrease in AEA Delivery Costs	$ 200,000
Coordinated Acquisition of Content	$1,000,000
Total	$22,941,500

These benefits will vary per year. Our numbers are quite conservative as we have averaged them over five years, the anticipated initial life of the project. One could argue that the total amount of benefit could occur each year once implemented.

There are countless variables involved in this project. To simplify this explanation, we are estimating that a reduction in costs for training personnel and training centers would balance out with the increased equipment needs for individuals and support costs (ie: ICN connectivity to schools).

There are also many benefits that are not quantifiable.